HARBOR MARINA GARFIELD BAY (PWSNO 1090187)
SOURCE WATER ASSESSMENT REPORT

December 3, 2002

State of Idaho
Department of Environmental Quality

SOURCE WATER ASSESSMENT FOR HARBOR MARINA GARFIELD BAY

Under the Federal Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. The Department of Environmental Quality is completing the assessments for all Idaho public drinking water systems. The assessment for your drinking water source is based on well construction characteristics; site specific sensitivity factors associated with the aquifer the water is drawn from; a land use inventory inside the well recharge zone; and water quality history. For non-community transient water systems like Harbor Marina Garfield Bay, recharge zones were generally delineated as a 1000-foot fixed radius around the wells.

This report, *Source Water Assessment for Harbor Marina Garfield Bay* describes factors used to assess susceptibility to contamination. The analysis relies on information from the well log; an inventory of land use, well site characteristics, potential contaminant sites identified through a Geographic Information System database search; and information from the public water system file. The ground water susceptibility analysis worksheet for Harbor Marina Garfield Bay is attached.

Taken into account with local knowledge and concerns, this assessment should be used as a planning tool to develop and implement appropriate protection measures for this system. **The results should <u>not</u> be used as an absolute measure of risk and are not intended to undermine the confidence in your water system.**

Well Construction. The Harbor Marina Garfield Bay water system serves a restaurant/bar, store, a residence and a 160 slip marina located on Lake Pend Oreille about 6.25 miles east of Sagle, Idaho. Drinking water is supplied by a 6-inch cased well located in a pit near the southeast corner of a repair shop and about 130 feet from the lake. The pit is about 19 inches deep, has a dirt floor, and is lined with a plastic barrel. The well, drilled into a shale formation on the east side of Garfield Bay in 1989, is 351 feet deep. The steel casing extends 24 inches above the surface to 59 feet below. The well is lined with 4-inch PVC with perforations between 273 and 293 feet and between 312 and 347 feet. The static water level at the time of a sanitary inspection in June 2000 was about 12 feet below ground surface and production was estimated to be 14 gallons per minute. The well log indicates that the static water level at the time of drilling was 25 feet below ground. A pump test in 1990 shows artesian pressure raising the water level to the surface.

Well Site Characteristics. Hydrologic sensitivity scores for a well are derived from the soil drainage classification inside the recharge zone boundaries and from information on the well log. Soils in the well recharge zone delineated for the Harbor Marina well are generally moderately well drained to well drained. Soils in this drainage classification provide little protection against migration of contaminants toward the well. The well log shows 8 feet of boulders and gravel lying over sedimentary rock at the well site. Surficial geological maps of North Idaho show a fault zone in the area of the Harbor Marina well that could provide a hydraulic connection between the well and Lake Pend Oreille.

Potential Contaminant Inventory. Land inside the recharge zone delineated for the Harbor Marina Garfield Bay well is put to commercial, residential and recreational use, including a 160 slip marina, and a fuel storage tank located about 80 feet northwest of the well. A concrete pad surrounding the well pit appeared to be in use for washing, storing and repairing boats and vehicles when the system was inspected in June 2000. Several containers of fuels, solvents and lubricants were on the concrete pad and in the repair shop within 50 feet of the well. These products contain numerous regulated volatile and synthetic organic chemicals. Idaho Rules for Public Drinking Water Systems (IDAPA 16.01.08) prohibit use of storage of these products within 50 feet of the well.

As noted during the June 2000 and earlier Sanitary Surveys, the pit around the well casing needs to be filled in and the surface sloped away from the wellhead. Contaminant laden runoff pooling in the pit could find a conduit into the ground water along the outer surface of the casing. The waters of Lake Pend Oreille, a potential source of microbial contaminants, cover about half of the 1000-foot buffer zone around the well. The system needs to have microscopic particulate analyses performed on samples from the well to determine whether it is surface water influenced.

Geologic Survey maps show an adit and an old lead/silver mine on the hillside above the marina.

Water Quality History. Harbor Marina Garfield Bay has had no water quality problems. Tests for total coliform bacteria were all negative in the period from March 1993 through January 2002. Between 1993 and 2000 concentrations of nitrates ranged from undetectable levels to 0.012 mg/l in samples submitted for testing. The Maximum Contaminant Level for nitrates is 10 mg/l. The system failed to monitor as required during several reporting periods. No synthetic or volatile organic chemicals were detected in samples tested in April 1995.

Susceptibility to Contamination. An analysis of the Harbor Marina Garfield Bay well, incorporating information from the public water system file and the potential contaminant inventory, ranked the well highly susceptible to synthetic and volatile organic chemical contamination. The presence of products containing these compounds inside the sanitary setback zone for the well automatically triggers a high susceptibility ranking. The risk of microbial contamination is high because of the unfilled pit surrounding the wellhead. The well may be surface water influenced. The well is moderately susceptible to inorganic chemical contamination, mostly because of risks factors related to local geology. The ground water susceptibility worksheet for your well is on page 6. Formulas used to compute final scores and rankings are at the bottom of the worksheet.

Source Water Protection. This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

Harbor Marina Garfield Bay has a good water quality history, but puts its well at risk through failure to comply with the minimum setbacks between the well and sources of synthetic and volatile organic contaminants and by retaining the unfilled pit around the wellhead. Drinking water protection for the marina should begin with maintaining and operating the system in compliance with *Idaho Rules for Public Drinking Water Systems.* The pit needs to be filled in and the surrounding area graded. Because this is an artesian well, a simple insulated structure over the wellhead may be needed to prevent freezing of the water filled casing. Boat washing and repair and similar activities need to be moved at least 50 feet from the wellhead. Fuel, lubricants, cleaning products and so on must not be used or stored within 50 feet of the well. The water system needs to complete testing to determine whether the well is surface water influenced.

A voluntary measure every system should employ is development of an emergency response plan. There is a simple, fill-in-the-blanks form available on the DEQ website (www.deq.state.id.us/water/water1.htm) to guide systems through the emergency planning process. Writing and implementing a testing schedule might be helpful for ensuring that necessary tasks don't get over looked.

Because Harbor Marina does not have direct jurisdiction over the entire recharge zone for its well, it will be important to form partnerships with neighboring landowners to regulate land uses that can degrade ground water quality. The goal of source water protection is to maintain current water quality for the future despite the changes we can expect with population growth in North Idaho.

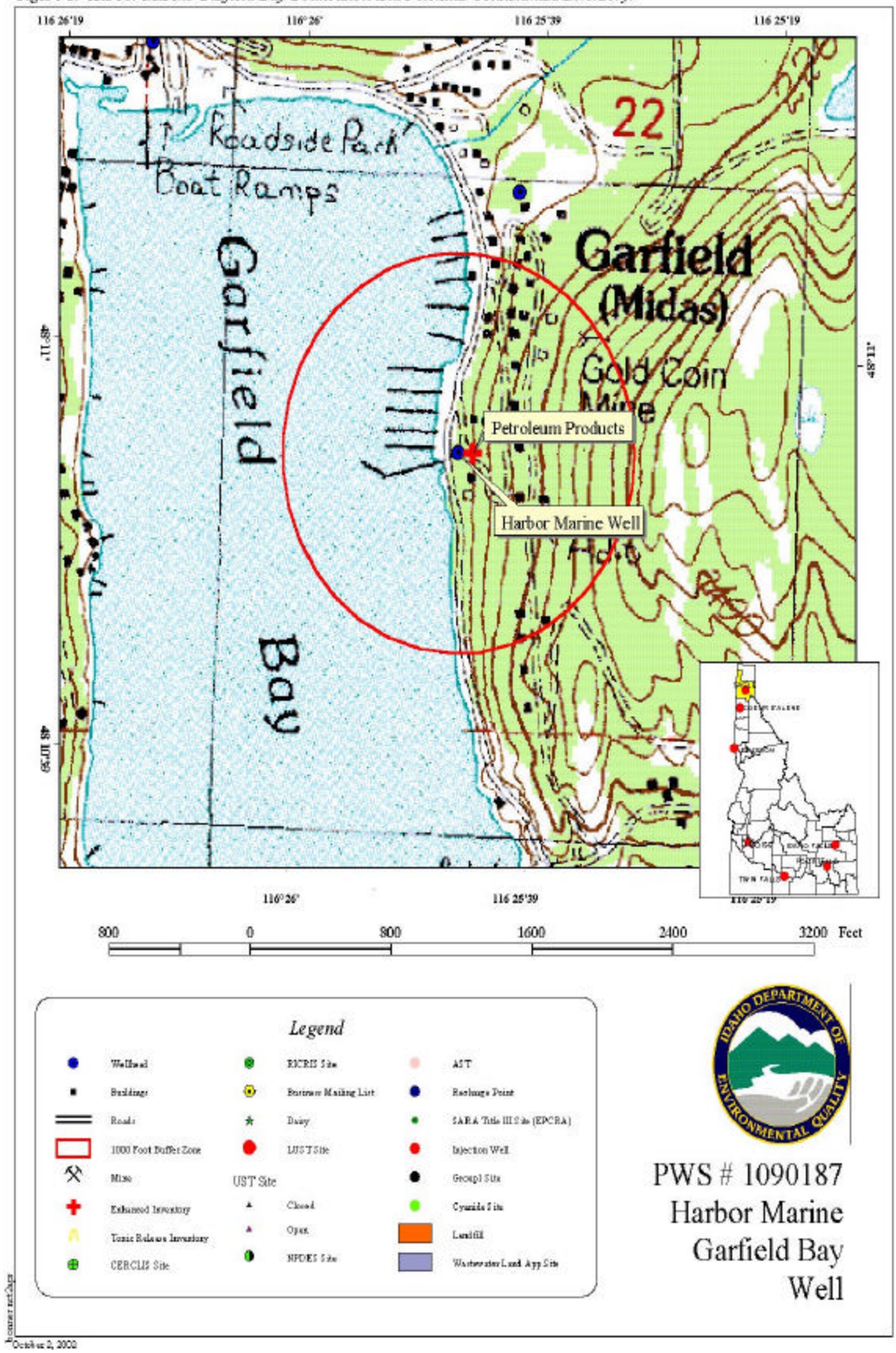
Assistance.
Public water suppliers and users may call the following IDEQ offices with questions about this assessment and to request help with drinking water protection planning.

Coeur d'Alene Regional DEQ Office	(208) 769-1422
State IDEQ Office	(208) 373-0502
DEQ Website:	www.deq.state.id.us

Water suppliers serving fewer than 10,000 persons may contact Melinda Harper of the Idaho Rural Water Association (208) 343-7001 for assistance with drinking water protection strategies.

Idaho Rural Water Association Website:	www.idahoruralwater.com
Home * A * Syst Website:	www.uwex.edu/homeasyst

Figure 1. Harbor Marine Garfield Bay Delineation and Potential Contaminant Inventory.



Ground Water Susceptibility

Public Water System Name : **HARBOR MARINA,GARFIELD BAY** Well : **WELL #1**

Public Water System Number : **1090187** 10/2/02 1:50:37 PM

1. System Construction			SCORE			
Drill Date	12/20/89					
Driller Log Available	YES					
Sanitary Survey (if yes, indicate date of last survey)	YES	2000				
Well meets IDWR construction standards	NO		1			
Wellhead and surface seal maintained	NO		1			
Casing and annular seal extend to low permeability unit	YES		0			
Highest production 100 feet below static water level	UNKNOWN		1			
Well protected from surface runoff	NO		1			
Total System Construction Score			**4**			
2. Hydrologic Sensitivity						
Soils are poorly to moderately drained	NO		2			
Vadose zone composed of gravel, fractured rock or unknown	NO		0			
Depth to first water > 300 feet	NO		1			
Aquitard present with > 50 feet cumulative thickness	NO		2			
Total Hydrologic Score			**5**			
			IOC	VOC	SOC	Microbial
3. Potential Contaminant / Land Use			Score	Score	Score	Score
Land Use	RECREATIONAL, COMMERCIAL		2	2	2	2
Farm chemical use high	NO		0	0	0	
IOC, VOC, SOC, or Microbial sources in Sanitary Setback	YES	Petroleum products, Pit	NO	YES	YES	YES
Total Potential Contaminant Source/Land Use Score			**2**	**2**	**2**	**2**
Potential Contaminant / Land Use - 1000-FOOT RADIUS						
Contaminant sources present (Number of Sources)	YES		1	1	1	1
(Score = # Sources X 2) 8 Points Maximum			2	2	2	2
Sources of Class II or III leacheable contaminants or Microbials	NO		1	1	1	
4 Points Maximum			1	1	1	
1000-Foot Radius contains or intercepts a Group 1 Area	NO		0	0	0	0
Agricultural Land Use	Less Than 25% Agricultural Land		0	0	0	0
Total Potential Contaminant Source / Land Use Score - 1000-Foot Radius			**3**	**3**	**3**	**2**
Cumulative Potential Contaminant / Land Use Score			**5**	**5**	**5**	**4**
4. Final Susceptibility Source Score			**10**	**10**	**10**	**11**
5. Final Well Ranking			Moderate	***High**	***High**	***High**

*Automatically ranked highly susceptible because of potential contaminant source inside sanitary setback zone.

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.27)

2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

Final Susceptibility Ranking:

0 - 5 Low Susceptibility
6 - 12 Moderate Susceptibility
> 13 High Susceptibility

POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ? Superfund? is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.